Claims

1. A radio resource control method in a mobile communication system comprising a serving cell (310) formed by a serving base station (312), at least one neighbour cell (320) formed by a neighbour base station (322), and user equipment (170) capable of receiving signals from said base stations (312, 322), the method comprising the steps of;

camping (610), in an idle state (412), on the serving cell (310);

receiving (640), in the user equipment (170), control information (316) for controlling cell change procedures of the user equipment (170), said cell change being conducted from the serving cell (310) to a target cell; and

performing (650), in the user equipment (170), the cell change procedures based on the received control information (316), characterized by

adjusting (620), before the control information (316) is received (640), at least one element of said control information (316) according to a predetermined time pattern, thus forming adjusted control information (316); and

controlling (630) the cell change procedures based on said adjusted control information (316).

2. The method of claim 1, characterized by adjusting (620) at least one element of the idle state (412) control information (316).

3. The method of claim 1, characterized by performing (650) the cell change procedures comprising at least the following steps:

selecting (850) the target cell based on the adjusted control information (316); and

camping (860) on the target cell.

4. The method of claim 1, characterized by performing (650) the cell change procedures comprising at least the following steps:

measuring (710) the quality (510) of the serving cell (310);

measuring (760) the quality (540) of at least one neighbour cell (320);

ranking (840) the measured cells (310, 320) based on the measured quality (510) of the serving cell (310) and the measured quality (540) of the neighbour cell (320); and

selecting (850) the target cell based on the ranking (840).

5. The method of claim 1, characterized by adjusting (620) at least one quality threshold (574) of the serving cell (310); and

performing (650) the cell change procedures comprising at least the following steps:

measuring (710) the quality (510) of the serving cell (310);

triggering (730) measurements on the neighbour cell (310) based on the measured quality (510) of the serving cell (310) and the quality threshold (574) of the serving cell (310); and

selecting (850) the target cell based on the triggered measurements.

6. The method of claim 1, characterized by camping (610) on the serving cell (310) that uses a different carrier frequency from that used by the neighbour cell (320);

adjusting (620) at least one inter-frequency measurement threshold (574); and

performing (650) the cell change procedures comprising at least the following steps:

measuring (710) the quality (510) of the serving cell (310);

triggering (730) inter-frequency measurements on the neighbour cell (310) based on the measured quality (510) of the serving cell (310) and the inter-frequency measurement threshold (574); and

selecting (850) the target cell based on the inter-frequency measurement.

7. The method of claim 1, characterized by camping (610) on the serving cell (310) that uses a different radio-access technology from that used by the neighbour cell (320);

adjusting (620) an inter-radio access technology measurement threshold (574); and

performing (650) the cell change procedures comprising at least the following steps:

measuring (710) the quality (510) of the serving cell (310);

triggering (730) inter-radio access technology measurements on the neighbour cell (310) based on the measured quality (510) of the serving cell (310) and the inter-radio access technology measurement threshold (574); and

selecting (850) the target cell based on the inter-radio access technology measurement.

8. The method of claim 1, characterized by adjusting (620) at least one quality threshold (504) of the neighbour cell (320); and

performing (650), in the user equipment (170), the cell change procedures comprising at least the following steps:

measuring (710) the quality (510) of the serving cell (310);

triggering (730) measurements on the neighbour cell (320) based on the measured quality (510) of the serving cell (310);

measuring (760) the quality (540) of the neighbour cell (320);

forming (780) the candidate cell selection based on the measured quality (540) of the neighbour cell (320) and the quality threshold (504) of the neighbour cell (320); and

selecting (850) the target cell based on the candidate cell selection.

9. The method of claim 1, characterized by adjusting (620) at least one quality offset (530) of the serving cell (310); and

performing (650), in the user equipment (170), the cell change procedures comprising at least the following steps:

measuring (710) the quality (510) of the serving cell (310);

applying (810) the quality offset (530) of the serving cell (310) to the measured quality (510) of the serving cell (310), thus obtaining an offset-applied quality (520) of the serving cell (310);

measuring (710) the quality (540) of at least one neighbour cell (320); and

selecting (850) the target cell based on the measured quality (540) of the neighbour cell (320), and the offset-applied quality (520) of the serving cell (310).

10. The method of claim 1, characterized by adjusting (620) at least one quality offset (560) of the neighbour cell (320); and

performing (650), in the user equipment (170), the cell change procedures comprising at least the following steps:

measuring (710) the quality (510) of the serving cell (310);

measuring (760) the quality (540) of at least one neighbour cell (320);

applying (820) the quality offset (560) of the neighbour cell (320) to the measured quality (540) of the neighbour cell (320), thus obtaining an offset-applied quality (550) of the neighbour cell (320); and

selecting (850) the target cell based on the measured quality (510) of the serving cell (310) and the offset-applied quality (550) of the neighbour cell (320).

11. The method of claim 1, characterized by adjusting (620) at least one temporary quality offset (562) of the neighbour cell (320) and a penalty time (566) of the neighbour cell (320); and

performing (650), in the user equipment (170), the cell change procedures comprising at least the following steps:

measuring (710) the quality (510) of the serving cell (310);

measuring (760) quality (540) of at least one neighbour cell (320);

applying (820) the quality offset (560) of the neighbour cell (320) to the measured quality (540) of the neighbour cell (320) for the duration of the penalty time (566), thus obtaining a temporary offset-applied quality (564) of the neighbour cell (320); and

selecting (850) the target cell based on the measured quality (510) of the serving cell (310) and the temporary offset-applied quality (564) of the neighbour cell (320).

12. The method of claim 1, characterized by adjusting (620) at least one element of the control information (316) to assumed capacity requirements of the mobile communication system.

13. The method of claim 1, characterized by adjusting (620) at least one element of the control information (316) based on assumed cell load of the serving cell (310).

14. The method of claim 1, characterized by camping (610), on the serving cell (310) belonging to the same hierarchical cell structure (200) as the neighbour cell (320);

adjusting (620) the prioritising information of hierarchical cell structure 200;

re-prioritising the cells 210 to270 in a hierarchical cell structure 200 using the adjusted prioritising information; and

performing (650) the cell change procedures based on the re-prioritising information.

15. The method of claim 1, characterized by camping (610) in one of the following idle states (412) specified in the 3GPP specifications: idle mode (400), CELL_FACH state (406), URA_PCH state (410), CELL_PCH state (408).

16. The method of claim 1, characterized by camping (610) on the serving cell (310) controlled by a base station controller (314) different from the base station controller (324) controlling the neighbour cell (320).

17. A mobile communication system, comprising:

a network part (122) for providing the fixed infrastructure of the mobile communication system;

the network part (122) comprises a serving base station (312) for forming a serving cell (310);

the network part (122) comprises a neighbour base station (322) for forming a neighbour cell (320);

a user equipment (170) comprising receiving means (900, 932, 934) for receiving signals from the serving base station (312) and from the neighbour base station (322);

the network part (122) comprises a control means (314) for controlling cell change procedures with control information (316), said cell change being conducted from the serving cell (310) to a target cell;

the user equipment (170) comprises cell change procedure means (934) for performing cell change procedures based on control information (316) received from the network part (122);

and the receiving means (900, 932, 934) and cell change procedure means (934) are configured to camp on the serving cell (310) in an idle state (412), characterized in that the network part (122) further comprises adjusting means (314) for adjusting at least one element of said control information (316) according to a predetermined time pattern, thus forming adjusted control information (316).

18. The mobile communication system of claim 17, characterized in that the adjusting means (314) are configured to adjust at least one element of the idle state (412) control information (316).

19. The mobile communication system of claim 17, characterized in that the cell change procedure means (934) are configured to select the target cell based on the adjusted control information (316); and

the receiving means (900, 932, 934) and the cell change procedure means (934) are configured to camp on the target cell.

20. The mobile communication system of claim 17, characterized in that the receiving means (900, 932, 934) and the cell change proce-

dure means (934) are configured to measure the quality (510) of the serving cell (310) based on the adjusted control information (316);

the receiving means (900, 932, 934) and the cell change procedure means (934) are configured to measure the quality (540) of at least one neighbour cell (320) based on the adjusted control information (316);

the cell change procedure means (934) are configured to rank the measured cells (310, 320) based on the measured quality (510) of the serving cell (310), the measured quality (540) of the neighbour cell (320), and the adjusted control information (316); and

the cell change procedure means (934) are configured to select the target cell based on the ranking.

21. The mobile communication system of claim 17, characterized in that the adjusting means (314) are configured to adjust at least one quality threshold (574) of the serving cell (310);

the receiving means (900, 932, 934) and the cell change procedure means (934) are configured to measure the quality (510) of the serving cell (310);

the cell change procedure means (934) are configured to trigger measurements on the neighbour cell (320) based on the measured quality (510) of the serving cell (310) and the quality threshold (574) of the serving cell (310); and

the cell change procedure means (934) are configured to select the target cell based on the triggered measurements.

22. The mobile communication system of claim 17, characterized in that the receiving means (900, 932, 934) are configured to operate at different carrier frequencies;

the adjusting means (312) are configured to adjust at least one inter-frequency measurement threshold (574);

the receiving means (900, 932, 934) and the cell change procedure means (934) are configured to perform inter-frequency measurements; and

the cell change procedure means (934) are configured to select the target cell based on the inter-frequency measurements.

23. The mobile communication system of claim 17, characterized in that the receiving means (900, 932, 934) are configured to operate with different radio access technologies; and

the adjusting means (312) are configured to adjust at least one inter- radio access technology measurement threshold (574);

the receiving means (900, 932, 934) and the cell change procedure means (934) are configured to perform inter-radio access technology measurements; and

the cell change procedure means (934) are configured to select the target cell based on the inter-radio access technology measurements.

24. The mobile communication system of claim 17, characterized in that the adjusting means (314) are configured to adjust at least one quality threshold (504) of the neighbour cell (310);

the receiving means (900, 932, 934) and the cell change procedure means (934) are configured to measure quality (510) of the serving cell (310);

the cell change procedure means (934) are configured to trigger measurements on the neighbour cell (320) based on the measured quality (510) of the serving cell (320);

the cell change procedure means (934) and the receiving means (900, 932, 934) are configured to measure the quality (540) of the neighbour cell (320);

the cell change procedure means (934) are configured to form the candidate cell selection based on the measured quality (540) of the neighbour cell (320) and the quality threshold of (504) the neighbour cell (320); and

the cell change procedure means (934) are configured to select the target cell based on the candidate cell selection.

25. The mobile communication system of claim 17, characterized in that the adjusting means (314) are configured to adjust at least one quality offset (530) of the serving cell (310);

the receiving means (900, 932, 934) and the cell change procedure means (934) are configured to measure the quality (510) of the serving cell (310);

the cell change procedure means (934) are configured to apply the quality offset (530) of the serving cell (310) to the measured quality (510) of the serving cell (310), thus producing an offset-applied quality (520) of the serving cell (310);

the cell change procedure means (934) and the receiving means (900, 932, 934) are configured to measure the quality (540) of at least one neighbour cell (320); and

the cell change procedure means (934) are configured to select the target cell based on the measured quality (540) of the neighbour cell (320), and the offset-applied quality (520) of the serving cell (310).

26. The mobile communication system of claim 17, characterized in that the adjusting means (314) are configured to adjust at least one quality offset (560) of the neighbour cell (310);

the receiving means (900, 932, 934) and the cell change procedure means (934) are configured to measure the quality (510) of the serving cell (310);

the cell change procedure means (934) and the receiving means (900, 932, 934) are configured to measure the quality (540) of at least one neighbour cell (320);

the cell change procedure means (934) are configured to apply the quality offset (560) of the neighbour cell (320) to the measured quality (540) of the neighbour cell (320), thus producing an offset-applied quality of the neighbour cell (320); and

the cell change procedure means (934) are configured to select the target cell based on the measured quality (510) of the serving cell (310), and the offset-applied quality (550) of the neighbour cell (320).

27. The mobile communication system of claim 17, characterized in that the adjusting means (314) are configured to adjust at least one temporary quality offset (562) of the neighbour cell (310) and a penalty time (566) of the neighbour cell (320);

the receiving means (900, 932, 934) and the cell change procedure means (934) are configured to measure the quality (510) of the serving cell (310);

the cell change procedure means (934) and the receiving means (900, 932, 934) are configured to measure the quality (540) of at least one neighbour cell (320);

the cell change procedure means (934) are configured to apply the quality offset (560) of the neighbour cell (320) for the duration of the penalty time (566) to the measured quality (540) of the neighbour cell (310), thus producing a temporary offset-applied quality (564) of the neighbour cell (320); and

the cell change procedure means (934) are configured to select the target cell based on the measured quality (510) of the serving cell (310), and the temporary offset-applied quality (564) of the neighbour cell (320).

28. The mobile communication system of claim 17, characterized in that the adjusting means (314) are configured to adjust at least one element of the control information (316) to assumed capacity requirements of the mobile communication system.

29. The mobile communication system of claim 17, characterized in that the adjusting means (314) are configured to adjust at least one element of the control information (316) based on an assumed cell load in the serving cell (310).

30. The mobile communication system of claim 17, characterized in that the serving base station (312) and the neighbour base station (322) are configured to form a hierarchical cell structure (200) such that the serving cell (310) and the neighbour cell (320) belong to the same hierarchical cell structure (200);

the adjusting means (312) are configured to adjust the prioritising information;

the control means (312) are configured to re-prioritise the serving cell (310) and the neighbour cell (320) based on the adjusted prioritising information; and

the cell change procedure means (934) are configured to perform the cell change procedures based on the re-prioritising.

31. The mobile communication system of claim 17, characterized in that the receiving means (900, 932, 934) and cell change procedure means (934) are configured to camp on the serving cell (310) in one of the following idle states specified in the 3GPP specifications: idle mode (400), CELL_FACH state (406), URA_PCH state (410), CELL_PCH state (408).

32. The mobile communication system of claim 17, characterized in that the network part (112) comprises separate base station controllers (314, 324) for the serving base station (314) and the neighbour base station (324).